Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MISTY HUANG

Appeal No. 2001-1986
Application No. 08/719,968

ON BRIEF

Before PAK, WALTZ, and NAGUMO, Administrative Patent Judges.

PAK, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 13, 15, 16, 22 and 23, which are all of the claims pending in the above-identified application.

Claims 22 and 23 are representative of the subject matter on appeal and read as follows:

22. A process for fabricating a printing plate, said process comprising:

a). selectively exposing a photosensitive resin composition consisting essentially of:

1). an ethylenically unsaturated polyurethane prepolymer which is the reaction product of X, Y and P and which prepolymer has the following structure:

$$Y' - X' \left(P' - X' \right)_n Y'$$

wherein P is selected from the group consisting of hydrogenated polybutadiene diols, hydrogenated polyisoprene diols, copolymer diols of hydrogenated butadiene with styrene, mixtures of any of the foregoing diols, and mixtures of any of the foregoing diols with a compound selected from the group consisting of unsaturated polyolefin diols, short chain diols, and mixtures of any of the foregoing; wherein X is independently selected from the group consisting of aromatic diisocyanates, aliphatic diisocyanates and mixtures of the foregoing; wherein Y is selected from the group consisting of acrylates, methacrylates and mixtures of the foregoing;

wherein n is an integer of from 1 to 20;

wherein P', X' and Y' are the reaction residues of P, X and Y;

2). at least one ethylenically unsaturated monomer; and

3). at least one photopolymerization initiator;

to actinic radiation; and

b). developing away any unpolymerized photosensitive resin.

23. A process for fabricating a printing plate, said process comprising:

a). selectively exposing a photosensitive resin composition comprising:

1). an ethylenically unsaturated polyurethane prepolymer which prepolymer is formed by: (a) reacting an excess of a diisocyanate with diols, which diols are selected from the group consisting of hydrogenated polybutadiene diols, hydrogenated polyisoprene diols, copolymer diols of hydrogenated butadiene with styrene, mixtures of any of the foregoing diols, and mixtures of any of the foregoing

diols with a compound selected from the group consisting of unsaturated polyolefin diols, short chain diols, and mixtures of any of the foregoing, to form an oligomer, and (b) further reacting the oligomer with a compound selected from the group consisting of hydroxyacrylates, hydroxymethacrylates and mixtures of the foregoing;

2) at least one ethylenically unsaturated monomer; and

3) at least one photopolymerization initiator;
to actinic radiation; and

b). developing away any unpolymerized photosensitive resin.

The prior art references relied upon by the examiner are:

Reyes	3,764,324	Oct. 9, 1973
Scheve	4,198,238	Apr. 15, 1980
Chen et al. (Chen)	4,423,135	Dec. 27, 1983
Hoffmann	4,925,775	May 15, 1990
Nakatsukasa et al. (Nakatsukasa) (Published European Patent Application)	0 470 834 A2	Feb. 12, 1992

Claims 13, 15, 16, 22 and 23 stand rejected under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Scheve, Nakatsukasa, Reyes, Hoffmann and Chen.

We have carefully evaluated the claims, specification and applied prior art, including all of the arguments advanced by both the examiner and appellants in support of their respective positions. This evaluation leads us to conclude that the examiner's § 103 rejection is not well founded for the reasons well articulated by appellants in their Brief. We add the following primarily for emphasis.

Under 35 U.S.C. § 103, "the examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d

1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). In other words, the burden of producing a factual basis to support a Section 103 rejection rests on the examiner. *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 177-78 (CCPA 1967).

Here, the examiner recognizes that neither Scheve nor Nakatsukasa teaches the claimed hydrogenated polyolefin diol as a part of a polyurethane prepolymer. See the Answer, page 3. To remedy this deficiency, the examiner relies on the disclosures of Reyes, Chen and Hoffmann to show that it would have been *prima facie* obvious to hydrogenate the polyolefin diol of the polyurethane prepolymer described in either Scheve or Nakatsukasa. See the Answer, pages 3 and 4. The examiner, however, acknowledges that "Chen et al, Reyes and Hoffmann do not disclose the use of urethanized polyolefins." See the Answer, page 4. In spite of this difference, the examiner has not demonstrated that the equivalency or advantage applicable to saturating or hydrogenating the particular polymers described in Reyes, Chen and Hoffmann is equally applicable to the polyurethane prepolymer of the type described in either Scheve or Nakatsukasa. The examiner simply has not supplied sufficient factual evidence and/or sound scientific reasoning explaining why

one of ordinary skill in the art would have been led to hydrogenate the polyolefin diol of the polyurethane prepolymer described in Scheve or Nakatsukasa[1].

[1]Our colleague takes the position that "the examiner's rejections over Nakatsukasa should be reversed," but the examiner's rejections over Scheve and the secondary references should be affirmed. However, the only rejection before us is based on "Scheve and Nakatsukasa in view of Reyes, Hoffmann and Chen et al." See the Answer, page 3.

Recognizing the applied prior art references themselves lack motivation or suggestion to hydrogenate a **particular part** of the polyurethane prepolymer described in Scheve, our colleague takes the position that:

The level of skill in this art is sufficiently high that one of ordinary skill in the art would recognize that the deleterious effect of unsaturation in polymer chains would be independent of the groups at the ends of the chains, especially as the chains get longer.

Our colleague, however, proffers no evidence supporting this position. Nor has the examiner proffered this position as the basis for his *prima facie* case of obviousness. See the Answer in its entirety.

Finally, our colleague takes the position that "it cannot be denied that hydrogenated polybutadiene has the same structure as polyethylene (footnote omitted)." Again, there is no evidence that hydrogenated polybutadiene has the same structure as polyethylene. Nor has the examiner proffered this position as the basis for his *prima facie* case of obviousness. Our colleague incorrectly assumes that butadiene units having doble bonds at the ends repeat linearly and that hydrogenation would not remove any double bond from the butadiene units

Under these circumstances, we are convinced that the examiner's § 103 rejection is fatally premised upon impermissible hindsight. *See W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Therefore, for the reasons set forth in the Brief and *supra*, we reverse the examiner's decision rejecting all of the appealed claims under 35 U.S.C. § 103.

REVERSED

CHUNG K. PAK Administrative Patent Judge	))))BOARD OF PATENT) APPEALS) AND
THOMAS A. WALTZ Administrative Patent Judge	) INTERFERENCES)

NAGUMO, Administrative Patent Judge, concurring-in-part and dissenting-in-part.

I agree with the majority that the rejections of claims 13, 15, 16, and 22 should be reversed. I also agree that the rejection of claim 23 over Nakatsukasa and secondary references should be reversed. My reasoning, however, differs significantly from that expressed in the majority opinion;

hence I write separately on this issue. Moreover, I would affirm the rejection of claim 23 over Scheve and the secondary references; hence, on this issue, I respectfully dissent.[2]

Rejections over Nakatsukasa and secondary references

I concur that the examiner's rejections over Nakatsukasa and secondary references should be reversed, but my reasoning differs significantly from that of the majority and that of Appellant, with which the majority expresses substantial agreement (Decision at 3). I find that Nakatsukasa does not disclose a urethane prepolymer that can be hydrogenated to meet the limitations of the prepolymer recited in Appellant's claims. Although a similar polymer can be constructed[3], Nakatsukasa distinguishes the nature of the urethane segments from the diene rubber segment, X. In particular, Nakatsukasa teaches that

> [a] long hard segment is formed by continuation of urethane bonds having high polarity and cohesiveness, and causes microscopic phase separation from a rubber molecular chain (soft segment) [i.e., X] having low polarity and cohesiveness. . . In case of using dihydric alcohol including R_4 of more than 2000 molecular weight, it becomes difficult to cause phase separation between the hard segment and the soft segment, a desired object cannot be attained, and hence, molecular weight of dihydric alcohol including R_4 is less than

[2] My colleagues take the position that there is only one rejection before the Board. (Decision at 4 n.1.) I find that the examiner has treated Nakatsukasa and Scheve independently; there is no attempt to combine their teachings. Moreover, Appellant treated these references independently in the principal and reply briefs. Hence, I too treat the rejections on the merits, as argued, rather than adhering to the formality of the heading of the rejection, which, in any event, did not confuse the Appellant.

[3] See Nakatsukasa, formula (1), with R_4 taken as a "portion excluding a hydroxyl group of dienic liquid rubber having a hydroxyl group of dihydric alcohol having less than 2000 molecular weight . . . " (Nakatsukasa at 3, ll. 55–56) and X taken as "a portion excluding a hydroxyl group of dienic liquid rubber having a hydroxyl group." (*Id.* at 4, ll. 39–40.)

> 2000, preferably less than 300 . . . is introduced into a skeleton of the hard segment.

(Nakatsukasa at 5, ll. 17–37.) With this understanding of the structure and function of the R_4 moiety, Appellant's prepolymer, which has the structure

$$Y^1—X^1—(P^1—X^1)_n—Y^1,$$

cannot be read on Nakatsukasa's urethane prepolymer because there is no structure corresponding to the repeated moiety P^1. (P^1 is defined in claim 22 as the reaction residue of a diol of one of the hydrogenated polymers of butadiene, isoprene, or styrene, or styrene-butadiene copolymer, and various other recited mixtures.) Nakatsukasa's prepolymer has only a single soft segment that corresponds to Appellant's P^1 moiety. Accordingly, hydrogenation would not result in Appellant's prepolymer, and a *prima facie* case of obviousness of the subject matter of the claims on appeal cannot be made out over Nakatsukasa, alone or in view of the secondary references, which do not address the structure of the urethane prepolymer.

Rejections over Scheve and secondary references

Scheve teaches polymerizable compositions comprising: (1) a liquid unsaturated polyester; (2) a terminally unsaturated urethane prepolymer; (3) at least one addition polymerizable monomer; (4) at least one photoinitiator; and (5) at least one thermal polymerization inhibitor. (Scheve at col. 2, ll. 17–33.) Scheve teaches that such compositions are selectively exposed to actinic radiation and developed to form printing plates. (*Id.* at col. 6, l. 66, through col. 7, l. 29.) Components 2) and 3) of the composition recited in Appellant's claims 22 and 23 read on Scheve's components (3) and (4). The composition recited in claim 23 is open to unrecited components without restriction

due to the use of the transitional term "comprising." *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 500, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("'Comprising' is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim") (citation omitted). Thus, the critical element is the urethane prepolymer, Scheve's component (2). Scheve teaches urethane prepolymers having the structure:

$$X\text{-}(DICN)\text{-}[(O\text{-}D\text{-}O)\text{-}(DICN)]_m\text{-}[(D'\text{-}O)\text{-}(DICN)]_n\text{-}X,$$

where X corresponds to Appellant's Y^1, DICN is a diisocyanate moiety, and "D and D' are polymeric backbones selected from hydroxy terminated homopolymers of butadiene . . . ethylene . . ." (Scheve at col. 2, l. 50, through col. 3, l. 13.)

The examiner found that the secondary references, which all relate to methods of making printing plates using photoreactive polymeric compositions, motivate using hydrogenated prepolymeric components in Scheve. (Answer at 4.) I concur, at least with respect to Chen and Hoffmann. I find that Scheve and the secondary references relate to analogous art: all concern making printing plates with photopolymerizable polymeric compositions. Moreover, each seeks similar properties in the produced printing plate: flexibility, abrasion resistance, resilience, solvent resistance (Scheve at col. 7, ll. 36–41); Chen at col. 3, ll. 11–27 (high tensile strength, elasticity, solvent resistance); Hoffman at col. 1, ll. 14–15 (high tensile strength). Thus, Scheve, Chen, and Hoffmann pass both prongs of the test for analogous art set out in *In re Clay*, 966 F.2d 656, 658–59, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992) ("Two criteria have evolved for determining whether prior

art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.") These references relate to the same field of endeavor and they address related problems. Thus, one of ordinary skill in the art would look to these references for their teachings. In particular, one skilled in the art would find a teaching, suggestion, or motivation to use hydrogenated polymeric dienes in any polymer present in a photosensitive composition for making printing plates in order to gain the advantages of improved thermal and oxidative resistance taught by Chen (Chen at col. 4, ll. 50–52) in addition to the high tensile strength and elasticity expected for the printing plates taught by these references. Hoffmann teaches that hydrogenated block (vinylaromatic-diene) copolymers are useful as substitutes for the non-hydrogenated elastic components of printing plate precursor materials. This teaching provides one of ordinary skill in the art with both the motivation to make the substitution as well as a reasonable expectation of success.

I disagree with my colleagues that the examiner has failed to supply sufficient evidence or sound scientific reasoning that "the saturating or hydrogenating of the particular polymers described [in the secondary references] is equally applicable to the polyurethane prepolymer of the type described in . . . Scheve." (Decision at 4.) The level of skill in this art is sufficiently high that one of ordinary skill in the art would recognize that the deleterious effect of unsaturation in polymer chains would be independent of the groups at the ends of the chains, especially as the chains get

longer. In my view, the examiner set forth an adequate rationale in the paragraph bridging pages 6 and 7 of the Answer:

> All the final plates have segments of polymerized butadiene and/or polymerized isoprene which would have residual double bonds susceptible to oxidation or swelling by ink after imaging. It is this structure that they have in common and this structure which varies in the final plates if hydrogenated polymerized butadiene and/or polymerized isoprene is used.

This rationale was set out during prosecution (See Paper No. 10, paragraph bridging pages 5 and 6) and adhered to during the final rejection (Paper No. 13 at 4). For these reasons, a particularized teaching relating specifically to urethane terminated polymer chains is not required. (Appellant has not challenged the merits of this reasoning; rather, Appellant appears to take the position that the references are not analogous. (Brief at 5–7.) Similarly, in the Reply, Appellant relies on the declaration of Dr. Leach, who concludes, without construing the claimed subject matter, that "in my opinion, neither Nakatsukasa nor Scheve teach or suggest the invention currently claimed by the patent application." (Leach Declaration at 3, Reply at 5.) Both positions, as shown *supra*, are not supported in the record.)

Moreover, Scheve's teaching of D and D' as polyethylene moieties stands as confirmation of the examiner's rationale that it would have been obvious for one of ordinary skill in the art to use hydrogenated polybutadiene to make Scheve's polyurethane prepolymer. It cannot be denied that

hydrogenated polybutadiene has the same structure as polyethylene.[4] Thus, Scheve teaches that the very structure resulting from the hydrogenation is a useful embodiment of his invention. Although this finding of fact could be used as part of the basis of a *prima facie* case of unpatentability of the claimed subject matter, it is not necessary, as the examiner's rationale suffices.

Finally, the reactions to make such a prepolymer are the same as those recited in Appellant's claim 23, step a: reacting an excess of diisocyanate with diols, and further reacting the resulting oligomer with hydroxy(meth)acrylates. (Scheve at col. 7, ll. 54–68.) In light of these findings of fact, which are well-supported by the evidence relied on by the examiner, I hold that a *prima facie* case of obviousness of the subject matter of claim 23 over the prior art of record has been made, and I would affirm the examiner's rejection of claim 23.

The status of claim 22 and its dependent claims, which limit the recited polymerizable composition by the phrase "consisting essentially of," is more problematic. As Appellant pointed out, Scheve distinguishes his invention from compositions having only urethane prepolymers, stating that the additional presence of polyester prepolymers results in better solvent resistance and washout characteristics. (Brief at 5; Scheve at col. 2, ll. 4–8.) The examiner is correct that the

[4] More precisely, end-to-end polymerized butadiene, also known as poly(1,4-butadiene). The structure of the cis-isomer is similar to that of natural rubber, while the structure of the trans-isomer is similar to that of gutta percha. See the entry from HAWLEY'S CONDENSED CHEMICAL DICTIONARY, 11th ed. at 932 (1987)(entry on polybutadiene), attached to this decision. The structures of natural rubber and gutta percha differ solely in that pendant methyl ($-CH_3$) groups take the place of hydrogen in polybutadiene. See Figure 32.4 of ROBERT T. MORRISON & ROBERT N. BOYD, ORGANIC CHEMISTRY, 3d ed. at 1048 (1973), also attached. Comparison of the structure of polyethylene (HAWLEY'S at 935, also attached to this dissent) with the structure of hydrogenated polybutadiene shows that they consist of a series of methylene ($-CH_2-$) groups bonded to one another in linear fashion. In a chemically fluent world, these elementary chemical facts would be sufficiently generally known as to be susceptible of notice, but precedent in our world is to the contrary, hence these references are made of record. The life of a patent examiner, as much as the life of a patent solicitor, is a hard one.

transitional language "consisting essentially of" excludes only additional components that change the basic and novel characteristics of Appellant's invention. However, the initial burden is on the examiner to show that, on the record before him or her, it is reasonable to shift the burden to the applicant to show why the additional components result in something other than the claimed invention. *Cf. In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) ("[W]hen the PTO shows sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not."). Here, Scheve's teaching of different relevant properties of printing plates depending on the identities of the prepolymers must be dealt with on the merits. In other words, to shift the burden to Appellant, the examiner must show that, not withstanding Scheve's teachings, one skilled in the art would nonetheless have expected the presence of polyesters not to have changed the basic and novel characteristics of Appellant's invention. Because the examiner has not made such a showing, I find that the weight of the evidence favors Appellant, and I agree that the examiner's rejection of claims 13, 15, 16, and 22 over Scheve and the secondary references must be reversed.

For the foregoing reasons, I respectfully concur-in-part and dissent-in-part.

_____
MARK NAGUMO
Administrative Patent Judge

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JUDGE PAK

APPEAL NO. 2001-1986

APPLICATION NO. 08/719,968

APJ PAK

APJ WALTZ

APJ NAGUMO:
CONCURRING-IN-PART AND DISSENTING-IN-PART

DECISION: **REVERSED**

PREPARED: Sep 15, 2003

OB/HD

PALM

ACTS 2

DISK (FOIA)

REPORT

BOOK